



Update on Life History Samples Processed for American Samoa Project

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Life History Samples Processed for American Samoa Project

As of September, I have received a total of 381 samples from the three target species. These samples were collected from March 30 through August 14. Table 1 details the sample size and size range by species, while Figure 1 shows the size frequency for each species.

Table 1: Sample size (n), and size range for the three selected species in American Samoa

	N	Min L (cm)	Max L (cm)	Average L (cm)
<i>Lethrinus rubrioperculatus</i>	136	16.4	32.5	25
<i>Naso lituratus</i>	166	15.3	28.1	21
<i>Chlorurus japanesis</i>	79	19.2	29.6	25

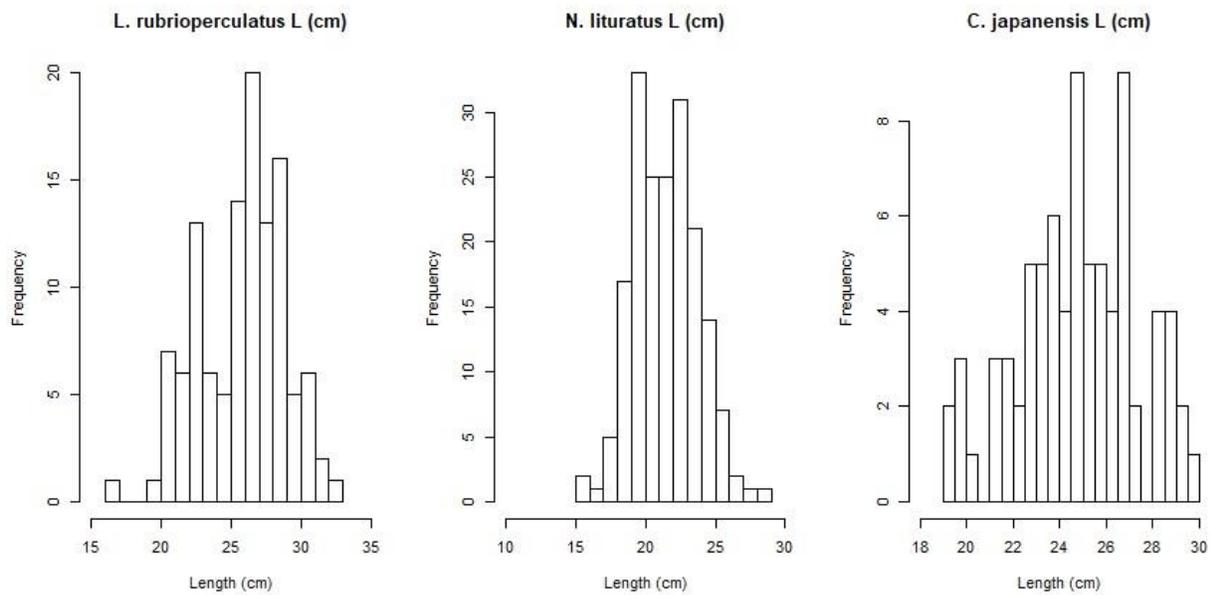


Figure 1: Size frequency for *L. rubrioperculatus* (Left), *N. lituratus* (Center) and *C. japanensis* (Right). Lengths are measured by fork length and are in cm.

Maturity

I have analyzed 117 gonad samples from three species. The rest of the samples are being processed at the histology lab and will be analyzed before the end of October. Maturity for females is divided into six classes based on determination of reproductive development

following the standardized terminology of Brown-Peterson (2011): Immature, Developing, Spawning Capable, Actively Spawning, Regressing, and Regenerating. Males are classified as either Immature or Mature based on the presence/absence of spermatozoa.

So far I have identified one immature female from *C. japonensis* with a size of 21.5 cm and one transitioning female to male with a size of 28.5. There have also been three transitioning female to male samples for *L. rubrioperculatus* varying in size from 28.7-29.4 cm. So far, there have been no immature samples for *L. rubrioperculatus* or *N. lituratus*.

Based on life history work from CNMI and Japan size at maturity for *L. rubrioperculatus* is around 22 cm (Ebisawa, 1997; Trianni, 2011). However, the twelve samples from American Samoa under 22 cm were all classified as mature; indicating *L. rubrioperculatus* matures earlier than is other regions. Size at transition ranged from 28 to 29 cm which is also smaller than size at transition from other locations.

Life history work from Guam indicated that *N. lituratus* matures early around 14 to 15 cm (Taylor et al., 2014). However, the sample size for American Samoa only includes two samples smaller than 16 cm and both were mature females.

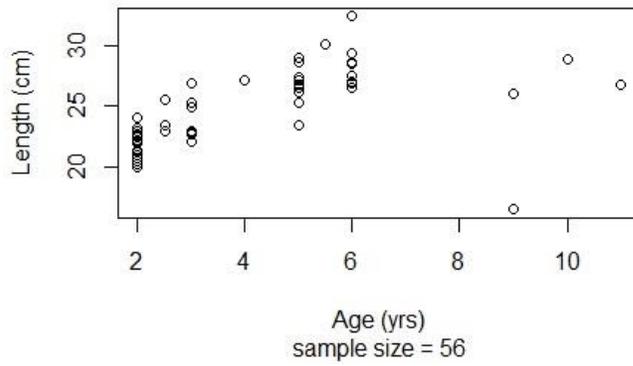
Age

All otoliths have been delivered to Dr. Brett Taylor for aging. He has aged the first 142 otoliths and is in the process of aging the second half of the otoliths. Table 2 details the age ranges for each of the three species aged to date, while Figures 2-4 show the length vs age graphs to date for each of the three species.

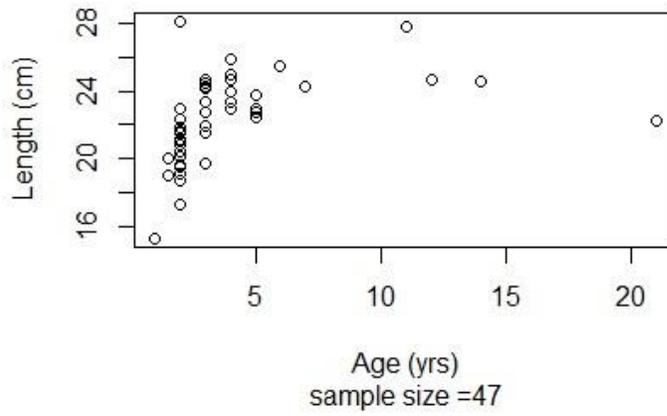
Table 2: Sample size (N), and ages for the three selected species in American Samoa so far.

	N	Min age	Max age	Average Age
<i>Lethrinus rubrioperculatus</i>	56	2	11	3.9
<i>Naso lituratus</i>	47	2	21	2.9
<i>Chlorurus japonensis</i>	39	1.5	7	2.9

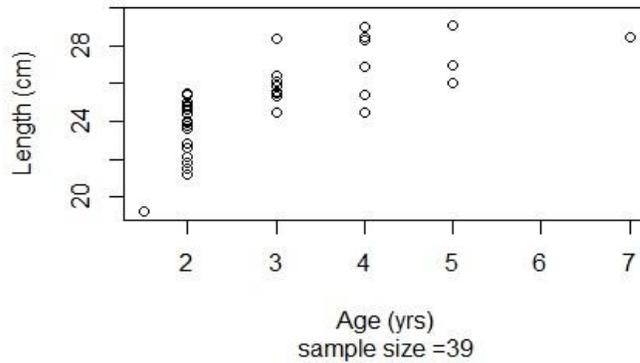
Age/Length for *L. rubrioperculatus*



Age/Length for *N. lituratus*



Age/Length for *C. japonensis*



Figures 2-4: Length (cm) vs. age (years) for *L. rubrioperculatus* (Figure 2), *N. lituratus* (Figure 3) and *C. japonensis* (Figure 4).

Pervious aging studies in CNMI and Japan aged *L. rubrioperculatus* at 8 years and 13 years respectively with 50% maturity happening between 1-2 years of age for both regions (Ebisawa, 1997; Ebisawa and Ozawa, 2009; Trianni, 2011). The oldest aged *L. rubrioperculatus* in the current sample size has been between these two estimates at 11 years.

N. lituratus had a maximum age of 13 years in Guam and reached 50% maturity at 2 years (Taylor et al., 2014). So far, the maximum age of *N. lituratus* in American Samoa has almost doubled the maximum age in Guam at 21 years.

Catch data

Domingo Ochavillo of DMWR compiled and sent me all of the length catch data from the 2010-2015 BioSampling program. Each species has over 4,000 length data points throughout the 5 year time period. The average size of surveyed catch is approximately one cm larger than the average size of the samples taken for the life history study. Table 3 details the sample size and size range by species, while Figure 5 shows the size frequency of the sampled catch from the BioSampling program.

Table 3: Sample size (N) and size range for the selected species in American Samoa based on catch sampled in the BioSampling program from 2010-2015

	N	Min L (cm)	Max L (cm)	Average L (cm)
<i>Lethrinus rubrioperculatus</i>	4075	16.6	43.9	26.9
<i>Naso lituratus</i>	9319	7.1	47.4	22.2
<i>Chlorurus japanesis</i>	7427	17	46.2	26.4

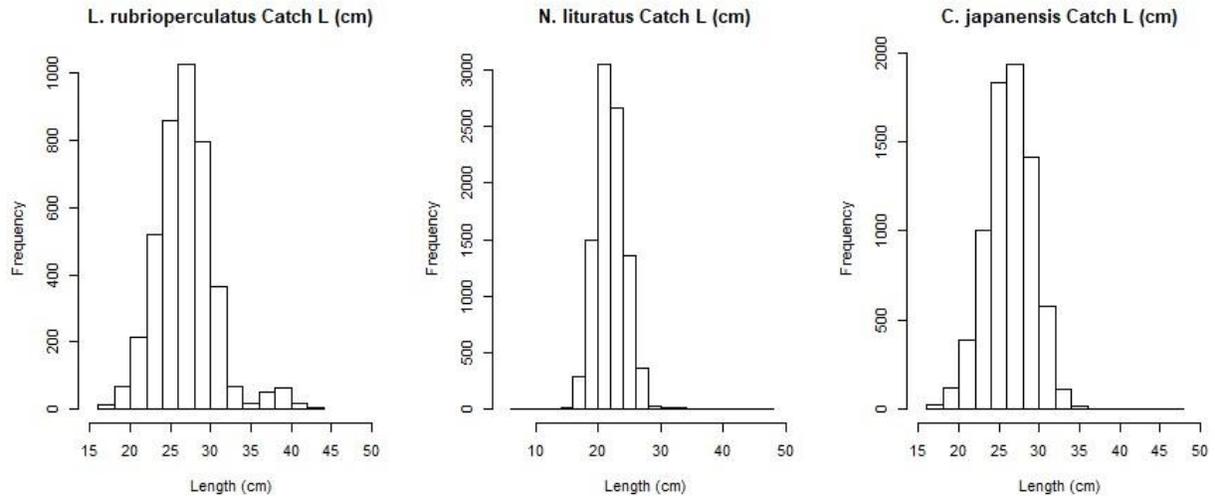


Figure 5: Length frequency of catch from 2010-2015 for the three selected species.

Next Steps

The next steps for this project are to finish aging the otoliths and staging the histology slides by the end of October. Once all of the samples have been processed, we will be able to create size and age at maturity estimates, as well as growth curves for the three selected species. The updated local life history information will then be used with the catch length data from the BioSampling program to produce a Spawning Potential Ratio (SPR) assessment of the three species for American Samoa. The results of the SPR assessment will allow local managers to better understand the current status of the stock in American Samoa.

Once all of the life history and stock assessment analysis have been completed we will be finishing up with a final workshop for local counterparts and stakeholders in American Samoa. The tentative dates for the final workshop are set for November 11-15 of 2019. During this workshop, we will cover the life history information gained from this study. As well as how to read otoliths and gonads for aging and maturity, and how to produce an SPR assessment using life history information and catch lengths from the different surveys.

Works Cited

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